

C L A I M S

- 1 1. A balancing apparatus for rotating bodies, comprising:
 - 2 - means for rotatably supporting a rotating body,
 - 3 - at least two balancing rings disposed on said rotating body in axial side by side relationship with each other and coaxial with said rotating body, said rings
 - 4 being each unbalanced and rotatable with said rotating body and further
 - 5 susceptible of assuming different angular positions relative to said rotating body,
 - 6 - detecting means for detecting unbalance of said rotating body and for
 - 7 detecting said angular positions of said rings relative to said rotating body, and
 - 8 - positioning means operatively connected with, and responsive to, said
 - 9 detecting means for carrying out an angular rotation between said rings and said
 - 10 rotating body to bring said rings to a relative angular position corresponding to a
 - 11 balance state of said rotating body, wherein said positioning means comprises
 - 12 - positioning members selectively engageable with said rings in a stopped
 - 13 position of said rotating body, and
 - 14 - driving means for selectively causing a relative angular rotation of said
 - 15 rings and said rotating body during mutual engagement of said positioning
 - 16 members and said rings.
- 1 2. An apparatus as claimed in claim 1, further comprising friction means
- 2 between said rings and said rotating body for preventing angular shiftings of said
- 3 rings relative to said rotating body during disengagement of said rings from said
- 4 positioning members.
- 1 3. An apparatus as claimed in claim 1, wherein said rings each have a
- 2 driving toothed and wherein said positioning members comprise at least one
- 3 positioning gear to be selectively and in succession engaged with said toothed

4 of each of said rings, said driving means comprising a servomotor for setting
5 said positioning gear in rotation when said positioning gear is in engagement
6 with a respective one of said rings and said rotating body is in said stopped
7 position.

1 4. An apparatus as claimed in claim 1, wherein said positioning members
2 are carried by a support structure movable parallel to a rotation axis of said
3 rotating body at least between a first and a second operating position, in which
4 said positioning members are respectively engaged with a respective one of said
5 rings.

1 5. An apparatus as claimed in claim 4, wherein said support structure
2 comprises a slide slidably mounted on a support post fastened to a table of a
3 machine tool.

1 6. An apparatus as claimed in claim 1, wherein said positioning members
2 comprise means for locking said rings, and said driving means comprises a
3 servomotor for angularly rotating said rotating body, said servomotor being
4 actuatable when said locking means selectively engages said rings.

1 7. An apparatus as claimed in claim 6, wherein said rings have respective
2 notches and said locking means comprises locking elements adapted to
3 selectively penetrate in said notches of said rings.

1 8. An apparatus as claimed in claim 7, wherein said notches are formed in
2 a circumferential surface of said rings and wherein said locking elements are
3 radially and selectively movable relative to said rings between a non-operating
4 position, in which said locking elements are disengaged from said notches, and
5 an operating position, in which said locking elements are in engagement with
6 said notches.

1 **9.** An apparatus as claimed in claim 6, wherein said rings are arranged on
2 a shaft of a tool-carrier rotated by a spindle of a machine tool, and wherein said
3 locking means is carried by a fixed structure of said machine tool.

1 **10.** An apparatus as claimed in claim 6, wherein said rings are arranged on
2 a shaft of a tool-carrier rotated by a spindle of a machine tool, and wherein said
3 locking means is disposed on a structure carried by a support of said spindle.

1 **11.** An apparatus as claimed in claim 10, wherein said locking means is
2 disposed on a slide slidable parallel to a rotation axis of said spindle.

1 **12.** An apparatus as claimed in claim 6, wherein said rings are arranged on
2 a shaft of a tool-carrier rotated by a spindle of a balancing machine, and wherein
3 said locking means is carried by a fixed structure of said balancing machine.

1 **13.** An apparatus as claimed in claim 12, wherein said fixed structure
2 extends parallel to said rotation axis of said spindle and wherein said locking
3 means is supported slidably along said fixed structure.

1 **14.** An apparatus as claimed in claim 1, wherein said rings each have an
2 unbalance milling.

1 **15.** An apparatus as claimed in claim 1, wherein said rings each have at
2 least one hole and wherein a gauged mass of a material having a specific weight
3 different from the specific weight of the material of said rings is arranged in said
4 at least one hole.

1 **16.** An apparatus as claimed in claim 1, further comprising adjustable
2 friction means between said rings and said rotating body.